

CLAIMS

1. A method of depositing a metallic layer on an exposed surface of previously deposited insulating layer on a substrate including treating the exposed surface with 5 hydrogen or a gaseous source of hydrogen in the presence of a plasma, prior to or during deposition of the metallic layer.
2. A method as claimed in Claim 1 wherein the hydrogen treatment modifies the exposed surface.
- 10 3. A method as claimed in Claim 1 wherein hydrogen is implanted in the exposed surface.
4. A method as claimed in any one of the preceding claims wherein the extent of the hydrogen treatment is such that the x-ray diffraction peak half width on a crystallographic 15 plane of a deposited metallic layer is narrowed.
5. A method as claimed in Claim 4 where the metallic layer is aluminium nitride.
6. A method as claimed in any one of the preceding claims wherein the plasma is an Inductively Coupled Plasma.

7. A method as claimed in Claim 6 wherein the substrate is placed on an RF biased platen.

8. A method as claimed in Claim 7 wherein the platen is heated.

5 9. A method as claimed in any one of Claims 1 to 4 wherein the plasma means is Reactive Ion Etching.

10. A method as claimed in Claim 9 wherein the treatment time is less than 15 minutes.

11. A method of depositing a metallic layer including the 10 modification of its crystallographic structure by the use of atomic hydrogen.

12. A method as claimed in Claim 11 wherein the metallic layer is deposited by sputtering and molecular hydrogen is added to a metallic sputtering process.

15 13. A method as claimed in Claim 11 or Claim 12 wherein the metallic layer is titanium or a titanium alloy and the modification includes the enhancement of the <002> crystallographic orientation of the titanium or alloy.

14. A method as claimed in Claim 11 or Claim 12 wherein the

metallic layer is copper, copper alloy, aluminium, or an aluminium alloy or titanium nitride the modification includes the enhancement of the <111> crystallographic orientation of the metallic layer.

5 15. A method of forming an acoustic wave device including depositing a metallic layer in accordance with a method as claimed in any one of the preceding claims.